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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,806	10/30/2001	Ming-Yu Lin	JCLA7567	5265

7590 09/21/2004

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EXAMINER	
CROSS, LATOYA I	
ART UNIT	**PAPER NUMBER**
1743	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,806	LIN ET AL.	
	Examiner	Art Unit	
	LaToya I. Cross	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to Applicants' amendments filed on June 28, 2004. Claims 1 and 3-9 are pending.

Withdrawal of Rejections from Previous Office Action

- The anticipatory rejection over Chen et al '853 is withdrawn in view of Applicants' amendment to incorporate the etching time into claim 1.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al '853.

Chen et al '853 disclose a method for cleaning a process chamber after an etching process is conducting. Chen et al '853 disclose that in a silicon nitride etching process, a wafer is coated with a photoresist layer, patterned and placed in an etch chamber (col. 2, lines 35-57). In a comparison example, Chen et al '853 disclose that after the etching process takes place, the wafer is removed from the chamber and the number of contaminating particles on the wafer is counted (col. 6, lines 34-43). See also Table 2. Chen et al '853 disclose that the presence of contamination particles in a process chamber during etching leads to the formation of voids, dislocations or short-circuits resulting in performance and reliability problems, and in reduction in yield. In counting the number of particles on the wafer after the etching process, one can determine the cleanliness of the process chamber (col. 1, lines 14-39). With respect to

claim 8, Chen et al '853 disclose a wafer (30) is disposed in etcher (10) having an etching chamber (20). The reference further discloses that etcher (10) is a plasma etching chamber for conducting a plasma etching process (col. 1, line 65 – col. 2, line 16).

Chen et al '853 differ from the instantly claimed invention in that Chen et al disclose an etching time of approximately 20-25 seconds, whereas Applicants' amended claims recite 9-15 seconds. In Chen et al '853, the etching process takes place for 20-25 seconds, after which a cleaning gas is flown into the etch chamber. Chen et al '853 teach evaluating the contamination inside an etching chamber after having run the etching process. It would have been obvious to one of ordinary skill in the art to run the etching process for any length of time that would produce potential contamination and then evaluate the contamination after the etching process. Applicants have not shown any criticality in conducting the etching process for 9-15 seconds, as opposed to 20-25 seconds. Further, Applicants have not shown any unexpected result in using the claimed amount of time over that disclosed by Chen et al '853.

3. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al '853 in view of US Patent 6,699,399 to Qian et al.

With respect to claims 4-7, Chen et al '853 teaches counting contaminating particles in silicon nitride etching processes; however, the reference fails to teach silicon oxide, polysilicon and metal etching processes.

With respect to etching processes other than silicon nitride etching, Qian et al teaches that in manufacturing integrated circuit devices, silicon dioxide, silicon nitride, polysilicon, metal silicide and monocrystalline silicon on a substrate undergo etching processes including the forming of a photoresist layer on the substrate. The reference further teaches that during

all of these etching processes, residues from the process are deposited on the walls of the processing chamber, which may lead to unwanted contamination of the substrate, itself.

While Chen et al '853 discloses counting contaminating particles resulting from silicon nitride etching processes, it would have been obvious to one of ordinary skill in the art to determine the number of particles resulting from other etching processes (including polysilicon, silicon dioxide and metal) to determine the cleanliness of these processing chambers since Qian et al teach that contaminating particles result from all of these processes. In determining the number of contaminating particles in all processes, the use would be notified of when the processing chamber should be cleaned and counting the contaminates would indicate the possibility of contaminated wafers being produced.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al '853 in view of US Patent 4,341,582 to Kohman et al.

With respect to claim 9, Chen et al '853 differs from the instantly claimed invention in that there is no disclosure of a port, vacuum chamber and alignment chamber.

Kohman et al teach that a common problem with etching wafers is atmospheric contamination of the photoresist coating, which results in undesirable effects. Kohman et al teach that pretreating the wafer in a vacuum overcomes this problem by preventing the wafer from being exposed to the atmosphere before the etching process. See col. 1, lines 47-56. Kohman et al also teach using a prealignment stage (16) in the etching process to align the wafer in its correct position before entering the etching chamber.

It would have been obvious to one of ordinary skill in the art to transport the wafers of Chen et al '853 to a vacuum chamber to prevent any external contamination from the outside

environment. Further, it would have been obvious to transfer the wafer to a pre-alignment chamber to aid in aligning the wafer in the correct position and prepare the wafer for etching.

Response to Arguments

5. Applicant's arguments filed June 28, 2004 have been fully considered but they are not persuasive. With respect to the rejection over Chen et al '853, Applicants argue that the reference fails to teach an etching time of 9-15 seconds as recited in the amended claims. In response, the Examiner noted in the previous Office Action that a time of 9-15 seconds was not specifically taught by Chen et al '853. However, it is the position of the Examiner that Chen et al's teaching of "approximately" 20-25 seconds makes obvious Applicant's claim of 9-15 seconds. The Examiner would first like to note that Applicants' specification, nor the arguments, point out the criticality in using 9-15 seconds. Further, there is no evidence in the record that 9-15 seconds would provide unexpected results over the 20-25 seconds taught by Chen et al.

In In re Wertheim, et al, 191 USPQ 90, 101 (CCPA 1976), the Court held obvious Appellant's claimed time for freezing a foam coffee extract of 7-25 seconds over the prior art teaching of "instantaneous" freezing, reasoning that Appellants failed to show that only their claimed freezing time produced the claimed result. Applying the same reasoning to the instant application, Applicants' have failed to show that only their etching time of 9-15 seconds provides contaminating particles that are to be detected to determine the cleanliness of the etching operation. Thus, the claimed invention remains to be deemed obvious over Chen et al '853.

With respect to the obviousness rejections over Chen et al '853 in view of Qian et al and Chen et al '853 in view of Kohman et al, Applicants have offered no further arguments as to patentability of the claimed invention. Thus, those rejections are also maintained.

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaToya I. Cross whose telephone number is 571-272-1256. The examiner can normally be reached on Monday-Friday 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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